

REMARKS

In response to the September 28, 2005 Office Action, Applicants respond to the Examiner's detailed action with the following remarks numbered according to the Examiner's communication. Claims 13, 14, and 27 – 29 are pending and rejected in the application. Claims 13 and 27 are amended hereby.

Response to Amendment

1. Responsive to the Examiner's reinstatement of the rejections over Stanasolovich, et al. to all pending claims, Applicants have amended the independent claims 13 and 27 as addressed below in the section entitled, "Claim Rejections – 35 USC §102."

Response to Declaration and Information Request

2-7. Regarding the Examiner's comments on the declaration, Applicants have amended the independent claims 13 and 27, which are now allowable for the reasons stated below in the section entitled, "Claim Rejections – 35 USC §103. Thus, Applicants no longer rely on the declaration to overcome the Kobayashi reference.

The Examiner asks other questions, and Applicants believe those questions are moot in view of the amendments to the claims. For the past several amendments Applicants have tried to put into words in the claims the steps that define the relative motion of the wafer with respect to the megasonic waves, but in each case a subsequent rejection read the claims on prior art methods. The claims as amended now distinguish the motion of the wafer relative to the structure of the transducer and thus avoids the difficult problem of crafting language to define the motion of the wafers relative to the megasonic waves.

Nevertheless, Applicants provide the following responses to the questions. Applicants believe that inventors Mayer and Schwartzman were the first inventors of the concept of megasonic cleaning of semiconductor wafers. Until the invention made and claimed herein, wafers in conventional megasonic apparatus were moved in a direction parallel to the long side of the transducers, and not parallel to the short side, as claimed

above. The Mountaintop facility where the invention was made was opened by RCA, the assignee of the original Mayer and Schwartzman invention. At least some of the inventors knew Mayer and Schwartzman personally and it is likely most or all of the inventors were familiar with the reputation of Mayer and Schwartzman as the first to invent megasonic cleaning of semiconductor wafers.

Exhibit #1 identifies "Fluorocarbon (now Verteq)" as a manufacturing licensee of the initial Mayer and Schwartzman patent that issued in 1975. At that time (31 years ago) the assignee, RCA, was an independent company. It was subsequently acquired by General Electric who sold the former RCA Mountaintop facility (where this invention was made) to Harris Corp., who transferred the Mountaintop facility to Intersil who in turn transferred it to the present owner, Fairchild Semiconductor Corporation. It would be unduly burdensome and likely fruitless to request the inventors to search for records of the license agreement with Fluorocarbon. It appears that Fluorocarbon no longer makes megasonic cleaning apparatus and no current site for Verteq can be found in the World Wide Web. A search of the WWW for Verteq yields numerous hits for refurbished equipment but no sites show new equipment and that leads to an inference that Verteq is no longer in business at all or at least not in the business of making megasonic equipment.

With regard to the Examiner's question of inventorship, Applicants request that the Examiner reconsiders. Applicants note that members of the Mountaintop Clean Team are listed on page "ii" of the Exhibit #1 and this list includes many of the applicants. However, Applicants submit that the applicants in the application are the proper inventors regardless of the membership of the Team. As the Examiner acknowledges in the detailed action, the Team conducted experiments described in the Exhibit #1. "One must contribute to the conception to be an inventor." *In re Hardee*, 223 USPQ 1122, 1123 (Comm'r Pat. 1984). Since Exhibit #1 addresses experimentation related to the invention after it was reduced to practice and not conception of the invention, Applicants respectfully submit that there is no question of inventorship raised by the Exhibit #1.

Claim Rejections – 35 USC §102

8-9. Responsive to the Examiner's rejection of Claims 13, 14, and 27 – 29 under 35 U.S.C. 102(b) as being anticipated by U.S. 5,533,540 (Stanasolovich, et al.), Applicants have amended Claims 13 and 27. The amendments to the claims are supported by the original Figures 1 and 2 as well as in paragraph [0025] of the specification as numbered in the published application, document number US 2002/0038662 A1. No new matter is added. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Stanasolovich teaches a megasonic cleaner with one or more transducers positioned at the bottom of a recirculation tank. An oscillating arm oscillates the wafer cassette within the recirculation tank. Stanasolovich does not teach the shape of the transducers or the direction of motion of the wafer cassette relative to an aspect of the transducer shape. In contrast, the amended Claims 13 and 27 require that each transducer have "a long side and a short side," and that the wafers are moved "parallel to the short side of the transducer." Since Stanasolovich does not teach these limitations, Applicants respectfully submit that Claims 13 and 27, as well as the claims that depend therefrom, are in condition for allowance.

10. Responsive to the Examiner's rejection of Claims 13, 14, and 27 – 29 under 35 U.S.C. 102(b) as being anticipated by any one of U.S. 3,893,869 and U.S. 4,118,649 (Mayer and Schwartzman), Applicants have amended Claims 13 and 27 as indicated above. Further, with regard to Claims 28 and 29, Applicants respectfully disagree. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Mayer and Schwartzman teach a megasonic cleaning system with transducers mounted on a vertical septum or end. The wafers are moved in directions that are parallel to the septum or end. Neither of the Mayer and Schwartzman patents teach that the motion of the wafers is relative to an aspect of the shape of the transducers. In contrast,

the amended Claims 13 and 27 require that each transducer have “a long side and a short side,” and that the wafers are moved “parallel to the short side of the transducer.” Since the Mayer and Shwartzman patents do not teach these limitations, Applicants respectfully submit that Claims 13 and 27, as well as the claims that depend therefrom, are in condition for allowance. Further, Claims 28 and 29 require that “the megasonic waves are generated at the **bottom** of a reservoir holding the cleaning fluid....” Since the Mayer and Shwartzman patents mount their transducers on a **vertical** septum or end, Applicants respectfully submit that the previously presented Claims 28 and 29 are further allowable over the Mayer and Shwartzman patents.

Claim Rejections – 35 USC §103

1-2. Applicants submit that the subject matter of the claims was commonly owned at the time of invention.

3-4. Responsive to the Examiner’s rejection of Claims 13, 14, and 27 – 29 under 35 U.S.C. 103(a) as being unpatentable over U.S. 6,085,764 (Kobayashi, et al.) in view of Handbook of Semiconductor Wafer Cleaning Technology (HSWCT), Applicants have amended Claims 13 and 27 as described above. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Kobayashi teaches an ultrasonic cleaning apparatus with an ultrasonic vibrator attached to the bottom of a tank. The wafers are vibrated minutely at ultrasonic frequencies in a horizontal and a vertical direction. Kobayashi does not teach the generation of megasonic waves – the frequency range of 26 to 40kHz taught by Kobayashi on lines 61 to 62 of column 2 are well within the ultrasonic range. Further, Kobayashi does not teach the shape of the ultrasonic transducers or the motion relative to an aspect of the transducers’ shape. The HSWCT adding the use of megasonic transducer arrays does not overcome all of these deficiencies. In contrast, the amended Claims 13 and 27 require that each transducer have “a long side and a short side,” and that the wafers are moved “parallel to the short side of the transducer.” Since Kobayashi and the HSWCT do not teach all the limitations of Claims 13 and 27, Applicants

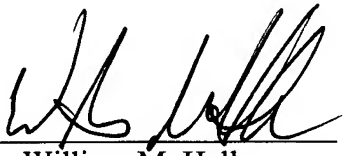
respectfully submit that Claims 13 and 27, as well as the claims that depend therefrom, are in condition for allowance.

Examiner's Response to Arguments

5-7. Applicants respectfully submit that the amendments to Claims 13 and 27 overcome the Examiner's rejections over Kobayashi, Stanasolovich, and Mayer and Shwartzman for the reasons stated in the above remarks.

Filed with this amendment and response is a petition to extend the time to answer together with the applicable fee to be paid from Deposit Account No.: 50-3010. Applicants respectfully request favorable consideration and the timely issuance of a Notice of Allowance in this case.

Respectfully submitted,
HISCOCK & BARCLAY, LLP

By: 
William M. Hall
Agent for Applicant Under
37 CFR §1.34
Reg. No. 52,985
2000 HSBC Plaza
Rochester, NY 14604
Tel: (585) 295-4481
Fax: (585) 295-8449